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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,086	08/06/2003	Andrew Perry	LAM2P427	9832

25920 7590 10/05/2004

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EXAMINER

ANDREA, BRIAN K

ART UNIT	PAPER NUMBER
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3662

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/636,086

Applicant(s)

PERRY ET AL.

Examiner

Brian K Andrea

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-21 is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,590,634 to Nishi et al. (hereinafter, "Nishi").

With regard to claim 1, Nishi teaches an optical alignment system for use in a semiconductor processing system, comprising: a wafer chuck LS1, LS2 (see figure 1 and column 44, lines 9-13) having an alignment feature FM1, FM2 (see also column 45, lines 41-46) integrated into the top surface of the wafer chuck; a beam-forming system 40 disposed above the wafer chuck, the beam forming system capable of emitting an optical signal onto the alignment feature (see column 45, lines 56-60); and a detector *capable* of detecting an amplitude of the optical signal emitted onto the alignment feature (see column 46, lines 27-43). Nishi teaches the detection of a reflected signal and, during processing, makes a measurement of the phase of the detected signal to detect positional information about the mark on the wafer chuck. Nishi uses a detector for receiving the signal and then passes the signal along to a processing system for making measurements of the detected signal. The detector is able to *detect* an *entire*

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received signal but does not process the signal in any way (the phase measurements are made in the processing steps). Therefore, the detector used by Nishi is inherently capable of detecting an amplitude of the received optical signal as required by the claim.

With regard to claim 2, Nishi teaches that the alignment feature is a reflective alignment feature capable of reflecting a portion of the optical signal to the beam detector (see column 45, lines 54-60).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of U.S. Patent No. 5,815,594 to Tanaka (hereinafter, "Tanaka").

Nishi (as discussed above with regard to claims 1 and 2) teaches the use of reflective alignment features for making alignment measurements in a wafer etching system. Nishi is silent as to the structure of the reflective surfaces. However, Tanaka teaches the use of reflective alignment marks for making alignment measurements in a wafer etching system and teaches that these marks can take any number of possible configurations (see figures 11(a) to 11(e)). Therefore, it would have been obvious for Nishi to use any type of appropriate reflective alignment marks, including the types of

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marks required by claims 3-5, for effecting the reflection of alignment light towards the detector.

5. Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,861,162 to Ina (hereinafter, "Ina '162") in view of U.S. Patent No. 4,952,060 to Ina et al. (hereinafter, "Ina '060").

With regard to claims 1 and 7, Ina '162 teaches an optical alignment system for use in a semiconductor processing system, comprising: a wafer chuck 3' (see figure 5) having an alignment feature 31, 33 integrated into the top surface of the wafer chuck (the wafer chuck, transparent member, and mark are all integrated together); a beam-forming system 36 disposed below the wafer chuck, the beam forming system capable of emitting an optical signal onto the alignment feature (see column 10, lines 3-11); and a detector *capable* of detecting an amplitude of the optical signal emitted onto the alignment feature (see column 10, lines 30-44). Ina '162 teaches the detection of a reflected signal and, during processing, makes a measurement of the alignment of the detected signal to detect positional information about the mark on the wafer chuck. Ina '162 uses a detector for receiving the signal and then passes the signal along to a processing system for making measurements of the detected signal. The detector is able to *detect* an *entire* received signal but does not process the signal in any way. Therefore, the detector used by Ina '162 is inherently capable of detecting an amplitude of the received optical signal as required by the claim.

Ina '162 does not teach that the light source is positioned above the wafer chuck but teaches the exact reverse – namely, that the light source is positioned below the

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wafer chuck and the detector is positioned above the wafer chuck with the light traveling through the wafer chuck and past the alignment marks. Ina '060 teaches, in the alignment of a wafer, the use of a light source positioned above the wafer where the light passes through the wafer chuck and past alignment marks for detection below the wafer chuck. Therefore, it would have been obvious, as evidenced by the teachings in Ina '060, to place the light source above the wafer chuck and the detector below the wafer chuck in Ina '162. The modification would still yield the same results (Ina '060 is positioning a wafer but is still using the same principles for alignment used in Ina '162).

With regard to claims 6 and 8, Ina '162 teaches that the alignment feature is a transmittance alignment feature capable of allowing a portion of the optical signal to pass through the wafer chuck to the detector (see figure 5).

Allowable Subject Matter

6. Claims 9-21 are allowed.

7. The following is an examiner's statement of reasons for allowance:

Claim 9 is allowable over the prior art because it requires an "alignment feature integrated into a wafer chuck" and the adjustment of "a beam-forming system to maximize an amplitude of the detected optical signal." None of the references used in the above rejections are directed at the alignment of a light source with respect to a wafer chuck but are used for the alignment of the wafer chuck. Therefore, none of the references seek to maximize the amplitude of a reflected signal. Further, with regard to claim 17, none of the above references teach the alignment of a robot arm using the same principles.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K Andrea whose telephone number is (703) 605-4245. The examiner can normally be reached on M-F 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (703) 306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BKA
9/20/04


BERNARRE GREGORY
PRIMARY EXAMINER
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